PROFILE PUBLICATIONS

The Curtiss P-40 Kittyhawk I - IV

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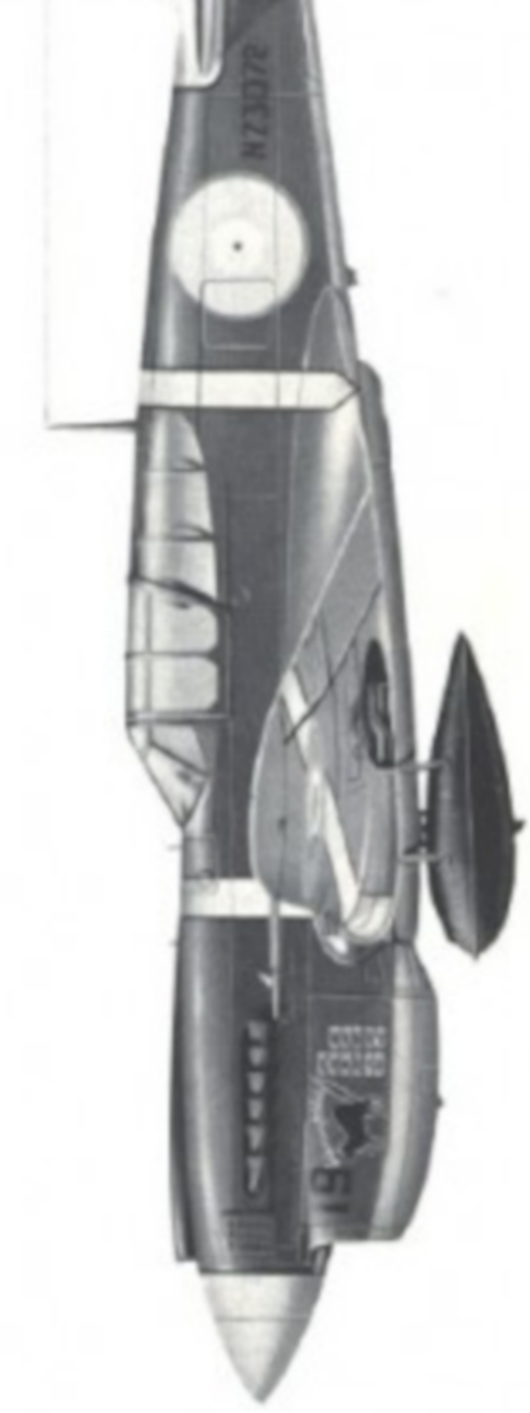


The Curtiss P-40
Kittyhawk I - IV

A Kittyhawk Mk. Ia of No. 112 "Shark" Squadron on a desert landing ground; the Kittyhawk came into its own in the North African campaigns, flying under primitive conditions over the most merciless terrain in the world. No. 112 Sqn. was the first fighter-bomber unit in the Desert Air Force. (Photo: Imp. War Mus. CM5881)

Compiled by RAY WAGNER and the Profile Publications Research Staff.

When the United States Army Air Corps issued its specification for a short-range, fast-climbing, medium-altitude interceptor in the mid-1930's, its thinking was based on the premise that American forces would be called upon to fight an enemy attempting to invade the American homeland. High-ranking generals could not envisage having to despatch vast fleets of bombers many hundred miles to destroy the enemy's war potential, or having to protect those bombers with long-range escort fighters. The American interceptor of the 1930's was designed as the destroyer of any enemy bomber which violated United States air space; it was not seen as a long-range tactical weapon.

This thinking led to the development of a number of short range interceptors, among them the Curtiss P-40. The story of this aeroplane, from the prototype XP-30 to the production P-40C Tomahawk, is related in detail in *Profile* No. 35; and in the present publication the development and service of the P-40D to P-40N variants is described. The use of this famous aircraft was too widespread, and the colours in which it fought too numerous, for its whole career to be dealt with in a single *Profile;* the story is also confused by the different names used by the various Allied nations during the Second World War for the same variants of the series. In British and Commonwealth service, the P-40D, P-40E, P-40F, P-40K, P-40M and P-40N were known respectively as the Kittyhawk I, Ia, II, III, III and IV; whereas in United States service the F, K, and P-40L models were known as the Warhawk. In the present *Profile* emphasis is given to the widespread use of the Kittyhawk by R.A.A.F., S.A.A.F., and R.A.F. squadrons in the Middle East; colour side-views of these aircraft are presented for the reader's interest, and also of the aircraft operated by the Dutch in the Far East, as this non-Commonwealth country operated under the local control of Australian commands. In a later *Profile*, the story of the P-40D and subsequent variants in United States, Soviet, and Chinese service will be described, under the title *The Curtiss P-40 Warhawk*.

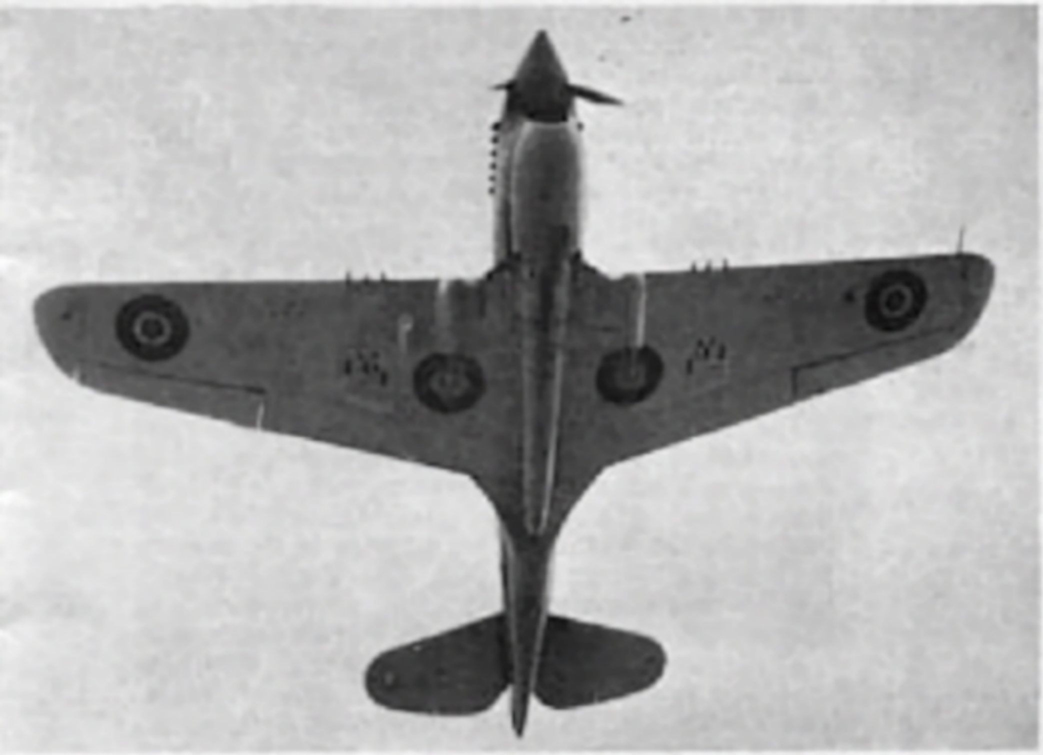
DEVELOPMENT OF THE P-40 SERIES

The Curtiss Airplane Division constructed a total of 523 P-40, P-40B and P-40C fighters for the U.S.A.A.C., and supplied a further 1,180 machines to the R.A.F. under the designations Tomahawk I, Ia, Ib, IIa, and IIb. Several hundred P-40's were also delivered to a number of America's other allies during the Second World War. Production of this model ended in the spring of 1941. Curtiss P-40 production far exceeded that of other fighter types in the early war years. In 1940, Curtiss built 778 P-40's and 481 H-75's, compared to only 152 rival land-based single-seat types. Production in 1941 amounted to 2,246 P-40's, 926 P-39's and 609 other single-seaters. Production in 1942 reached 4,453 P-40's, 1,972 P-39's, 1,264 P-38's, 632 P-51's and 530 P-47's.

By May 1941 the production lines at Curtiss were busy with a new model, the P-40D, powered by a new 1,150 h.p. Allison V-1710-39 Model F engine. The story of this engine and of how it came to be mated to the P-40D is worth examination.

During the summer of 1939 Europe was preparing for a second "Great War", and all the major powers were building fighters and bombers of every con-

The Curtiss H87A-1, or Kittyhawk I; the first twenty aircraft mounted a wing armament of four ·50 calibre machine guns.



The Royal Air Force ordered 560 Kittyhawk I's and these were delivered late in 1941. This aircraft is one of the batch AK591-AL230, *with six wing guns.*
(Photo: via R. Ward)

Seen here in the early green/brown/sky colour scheme, AK571 *was the first Kittyhawk built; its maiden flight was made on 22nd May 1941.* (Photo: via R. Ward)

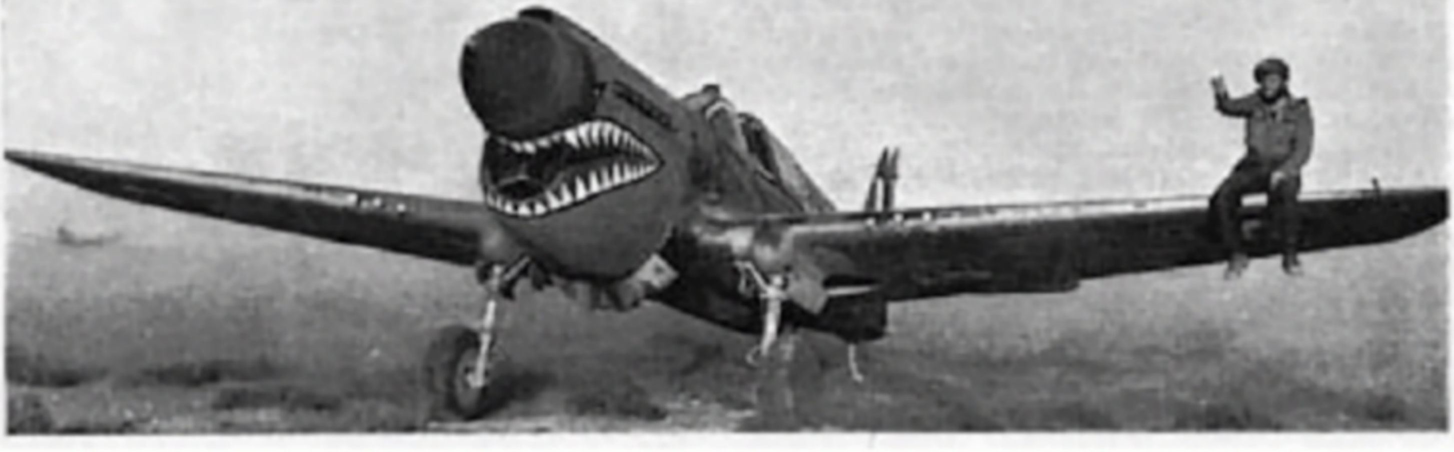
ceivable design. A number of American designers arrived in England and Germany to learn at first hand just what the fighter of the next five years would look like, and what duties it would be called upon to perform. Among the many American companies influenced by European fighter design was Curtiss, and its design staff returned home with what they considered to be the best concept of the advantages of these new European types. A proposal was put before the Army Air Corps, which drew up a specification around it, and two prototypes of the XP-46, as it was designated, were ordered on 29th September, 1939.

The Allison Engine Company had, in the meanwhile, developed the V-1710-39 engine rated at 1,150 h.p., and this was specified as the powerplant of the new fighter. This was smaller than the P-40 and utilised an inward-retracting undercarriage of wide track. It mounted eight ·30 calibre wing guns and two ·50 calibre weapons in the forward fuselage decking. The original specification called for a maximum speed of 410 m.p.h. at 15,000 feet, at a weight of 5,471 lbs. empty and 6,849 lbs. fully loaded.

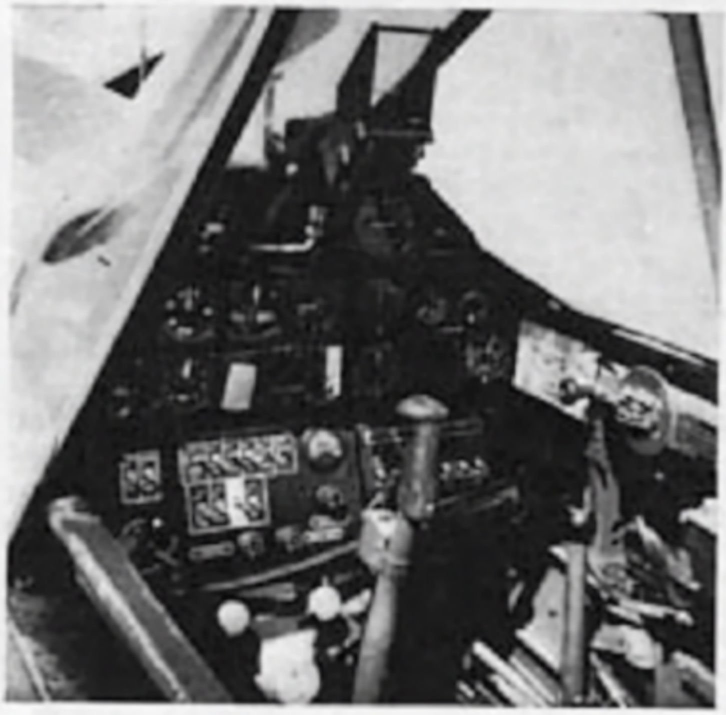
One month after the prototypes had been ordered, the A.A.C. asked the Curtiss Company to install self-sealing fuel tanks and 65 lbs. of armour for pilot protection. One prototype, the XP-46A, was delivered without armament to expedite service trials, but by the time the XP-46 made its maiden flight on 15th February 1941 a development of the P-40, the Model D, was ready. Additionally, the weight of fuel and crew protection had reduced performance to 355 m.p.h. at altitude, only three miles per hour faster than the P-40C then in full production. Rather than interrupt the P-40 production lines for a new aircraft the A.A.C. decided to drop the XP-46 design and adapt the Allison engine to the Curtiss P-40 airframe. This proved to be a wise decision for on test the XP-46 was found to be generally inferior to the P-40D. Substitution of the modified P-40 was proposed on 10th June 1940, and Curtiss agreed to undertake redesign of the basic Hawk 81A fighter to take the improved powerplant. Even before the first P-40D was built the United Kingdom had ordered 560 for the Royal Air Force, in which service they were known as the Kittyhawk Mark I.

The first H87A-1, serial *AK571*, made its maiden flight on 22nd May 1941: the Allison powerplant had an external spur propeller reduction gear instead of the internal spur used on the C15 engine, which had the effect of shortening the P-40's nose, raising the thrust line and reducing fuselage length to 31 ft. 2 in. The fuel capacity included 148 gallons in leak-proof self-sealing tanks and 52 gallons in a centrally-mounted drop-tank. The radiator was enlarged and moved forward, the undercarriage legs shortened and the method of wheel retraction modified. The engine

A Kittyhawk Mk. Ia (P-40E-1) of No. 112 "Shark" Squadron, R.A.F., at Sidi Heneish airstrip in 1941. The piratically-bearded warrior sitting on the wing provided "eyes" for the pilot during taxying; the cowling of the Allison engine effectively blocked forward visibility from the cockpit.
(Photo: Imp. War Mus. CM2730)



Cockpit and gunsight details of Desert Air Force Kittyhawks Mk. Ia; note operations log under cockpit, showing tally of nine bombing missions and three German aircraft shot down.
(Photos via R. Ward)



cowling was redesigned and given a smoother contour and the fuselage cross-section reduced.

Four ·50 calibre machine guns were mounted in the wings of the first twenty aircraft, but the remaining 540 H87A-2's had six wing guns. These machines were delivered to the Royal Air Force late in 1941 and serials ran from *AK571* to *AL230*.

LEND-LEASE KITTYHAWKS

Passage of the Lend-Lease Act provided U.S. Government funds for more foreign contracts and in April 1941 the P-40 was the subject of one of the largest lend-lease allocations involving 1,500 aircraft. These were the improved P-40E-1 or Kittyhawk Ia (H87A-3), under Defence Aid contract DA-3 approved on 12th May 1941. The Mark Ia designation was applied to distinguish their lend-lease origin, and they were identical to the P-40E with the exception of British equipment such as radio installations.

Weighing 6,350 lbs. empty, the P-40E grossed from 8,100 to 9,100 lbs. depending on load. In the lighter condition take-off ground run was 1,300 feet on a hard surface; initial climb was 2,050 feet per minute, reaching 15,000 feet in 8·3 minutes. Service ceiling was 29,000 feet; and maximum speed was 354 m.p.h. at 15,000 feet. Range with internal fuel was 700 miles at 185 m.p.h. A number of P-40E's were converted to dual-control trainers by the removal of the fuselage fuel tank, and installation of a second cockpit.

The R.A.F.'s Kittyhawk I and Ia's went into action on New Year's Day 1942 over the Western Desert, and were used against Rommel's *Afrika Korps* and the Italian forces in North Africa throughout the year. The squadrons which operated the type included Nos. 94, 112, 250, 260 and 450 R.A.F., No. 3 R.A.A.F. and Nos. 5 and 7 S.A.A.F. A series of extracts from the history of No. 112 Squadron, the famous "Sharks", will be found below.

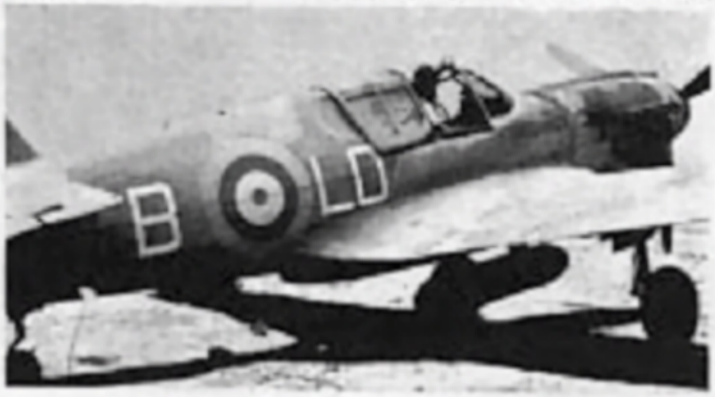
Twelve aircraft went to Canada in March 1942 and were delivered by rail. Two main batches of Mk. Ia's were accepted by the R.A.F., one serialled *ET100* to *ET999* inclusive, the second from *EV100* to *EV699*.

The Allison engine's poor high-altitude output limited the overall performance of the Kittyhawk, to a point well below that of the Messerschmitt Bf 109F then in *Luftwaffe* service. Better possibilities were offered by the production in America of the famous Rolls-Royce Merlin engine. The Packard-Merlin P-40's were designated P-40F; their development will be described fully in a later *Profile*, but although given the alternative designation Kittyhawk II, the type never saw service with British Commonwealth forces. Two hundred and fifty machines were allocated to the R.A.F. but were never delivered. A certain number of this batch, drawn from the block serialled *FL219* to *FL368*, were supplied in the event to Free French units which operated them in North Africa. Others went to Russia, some were lost at sea, and still others were retained by the U.S. Army Air Corps.

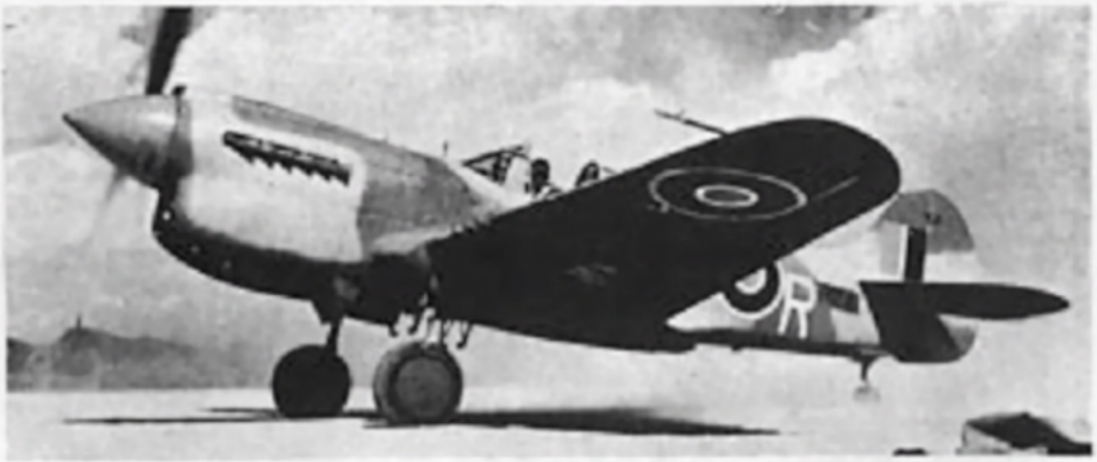
The next model, the P-40K, was originally scheduled for Lend-Lease supply to China until the projected Curtiss P-60A could enter production. To take up the slack caused by delays in the P-60 programme (which was dropped altogether in January 1942) the 600 planned P-40K's were increased to 2,000 K and L models in a contract placed on 11th June and approved on 15th June 1942. An Allison V-1710-73 engine providing 1,325 h.p. for take-off and 1,150 h.p. at 11,800 feet powered the 600 P-40K-1's, which appeared in August 1942 and were similar to the late-production P-40E's except for the more powerful engine with an auto manifold pressure regulator. The P-40K-5 added rotary valve cooling.

Initial production K-1 to K-5 aircraft retained the short fuselage of the E-model, and to correct a tendency to swing during take-off they were fitted with a small dorsal fin strake. A number of late production P-40E's also had this modification. The K-10 and K-15 had the slightly lengthened fuselage of the F model. The performance of the P-40K included a maximum speed ranging from 320 m.p.h. at 5,000 feet to 362 m.p.h. at 15,000 feet. Cruising speed was 290 m.p.h. and landing speed 82 m.p.h.;

AK919, *LD-B, the Kittyhawk Mk. I flown by Squadron Leader Judd, C.O. of No. 250 Sqn. R.A.F. in the Western Desert in August 1942. (See colour illustration on p.8). Note Hurricane belly tank.* (Photo: Imp. War Mus. CM3136)



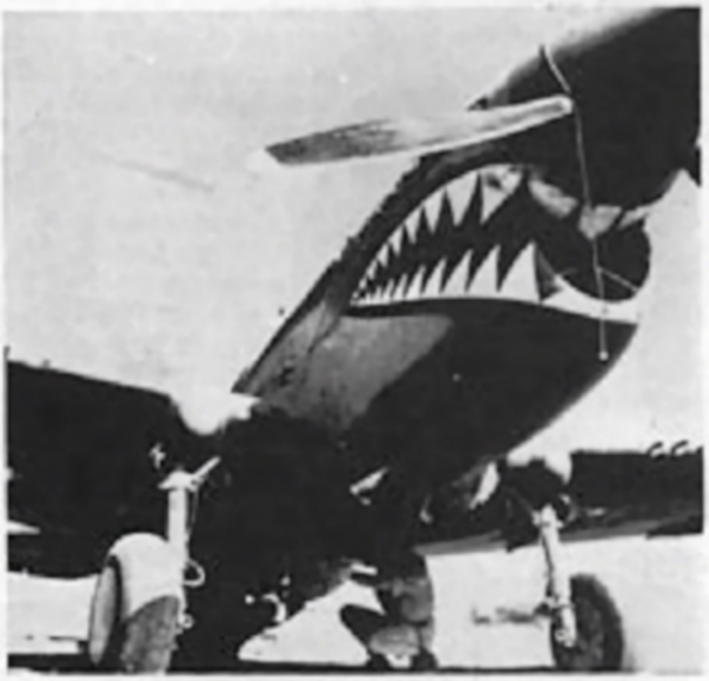
FR241, a Kittyhawk Mk. III of No. 260 Sqn., warming up on a desert landing ground. Note yellow outer ring of under-wing roundel
(Photo: Imp. War Mus. CM3756)



climb to 15,000 feet required 7·5 minutes and the service ceiling was 28,000 feet. Range varied from 350 miles, with a 500 lb. bomb mounted, to a 1,600 mile ferry range. Weights were 6,400 lbs. empty, 8,400 lbs. gross and 10,000 lbs. maximum.

Altogether, 1,300 K-models were delivered, mostly for service with the U.S. forces in Asia and the Pacific and with the Chinese Air Force; however, twenty-one machines were delivered to the Royal Air Force under the designation Kittyhawk III, serialled from *FL710* to *FL730*.

The P-40L and P-40M were produced in parallel; the L-model, a light-weight stripped machine known affectionately as the "Gypsy Rose Lee" after the famous strip-tease dancer of the time, was produced under the same contract as the P-40K. The M-model, on the other hand, was produced specifically for export to the United Kingdom, a Lend-Lease contract being approved on 24th August 1942. Their Allison V-1710-81 engines gave 1,200 h.p. for take-off, 1,125 h.p. at 14,600 feet, and 1,360 h.p. war emergency power. First appearing in November 1942, the P-40M was essentially similar to the L and was fitted with the standard six wing guns and 157 gallon internal fuel capacity. Performance details may be found in the specification below. All but five of the P-40M's constructed were delivered to the R.A.F., the R.A.A.F., and the R.N.Z.A.F. as the Kittyhawk III. The type served with British Commonwealth forces in the Far East; and a number were operated in Italy by No. 5 Squadron, South African Air Force. The model was delivered in seven main batches as follows: *FL875-FL905, FR111-FR140, FR210-FR361, FR383-FR392, FR414-FR521, FR779-FR872, FS100-FS269.*



Unusual armament visible on Mk. Ia AK772, GA-Y of No. 112 Sqn. at Gambut Main in June 1942; two 250 lb. bombs mounted in tandem under the centre-section. Note also plugged exhaust ports, with cord linking individual plugs. (Photo: via R. Ward)

THE KITTYHAWK IV

The final version of the P-40 series to see service with the Commonwealth air forces was the P-40N, or Kittyhawk IV. The performance of the preceding models was still causing some concern, and various modifications were introduced with the N-model in 1943. Two of the six wing-mounted machine-guns were removed; smaller and lighter undercarriage wheels were installed; head armour was re-introduced, and aluminium radiators and oil coolers installed. The N-1 appeared in March 1943, still powered by the V-1710-81 but with 122 gallons internal fuel capacity and a generally lighter structure than its predecessors. With weight reduced to 6,000 lbs. empty, 7,400 lbs. gross and 8,850 maximum, the N-1 was the fastest P-40 service variant and was intended for high altitude combat. Top speed was 378 m.p.h. at 10,500 feet, and the service ceiling was up to 38,000 feet;

A formation of "Shark" Squadron aircraft over North Africa; the three rear machines are each armed with two 250 lb. bombs.
(Photo: Imp. War Mus. CNA1136)

FR817, *GL-O "Lady Godiva", a Mk. III serving with No. 5 Sqn. South African Air Force in Italy, 1945.*
(Photo: Imp. War Mus. CMA2262)

climb to 15,000 feet was recorded as 6·7 minutes.

After 400 P-40N-1's had been produced, the N-5 sub-type appeared in 1943 with improved rear vision; this was achieved by increasing the glazing in the rear cockpit area and fitting a frameless sliding hood. In all 1,100 N-5's were built; the six wing guns were restored, and underwing racks fitted for bombs or drop tanks. The forward portion of the wing fuel tanks was also re-introduced. The new gross weight of 8,350 lbs. limited top speed to 350 m.p.h. at 16,400 feet, and service ceiling to 31,000 feet; climb rate was 7·3 minutes to 14,000 feet. The range was 340 miles with a 500 lb. bomb mounted, but three drop tanks promised a ferry range of up to 3,100 miles at 198 m.p.h.

One hundred P-40N-10's were modified for winter operations, and 377 P-40N-15's differed in having the battery located forward of the firewall, and new landing lights. More widely used were the 1,523 examples of the P-40N-20, which used the V-1710-99 engine, simply an -81 powerplant with an automatic engine control unit. The last aircraft on this contract were the N-25 sub-types, differing only in their revised instrument panels.

On 14th February 1944 another thousand "Warhawks" were ordered, broken down into a batch of 500 N-30's and 500 N-35's. They were externally similar to the N-25 except for valve and electrical system changes. As late as 30th June 1944, when the front-line equipment of all major air forces had far outpaced the potential of the P-40 series, an order for yet another thousand aircraft was approved. This was however cut back to 220 P-40N-40's, powered by Allison V-1710-115 engines and featuring metal-covered ailerons. This was the last service variant to leave the Curtiss factories.

Most of the N-series were shipped abroad on Lend-Lease allocation, including the majority of the 2,097 P-40's sent to the Soviet Union, and the 586 Kittyhawk IV's delivered to the Royal Air Force, the Royal Australian Air Force, and the Royal New Zealand Air Force for service in the Far East and in Italy.

Kittyhawk Mk. III FR864 *GA-M, flown from Pachino/Agnone in August 1943 by Squadron Leader Illingworth. Note bomb load; two 250 lb. under fuselage and four 40 lb. anti-personnel under wings.* (Photo: via R. Ward)

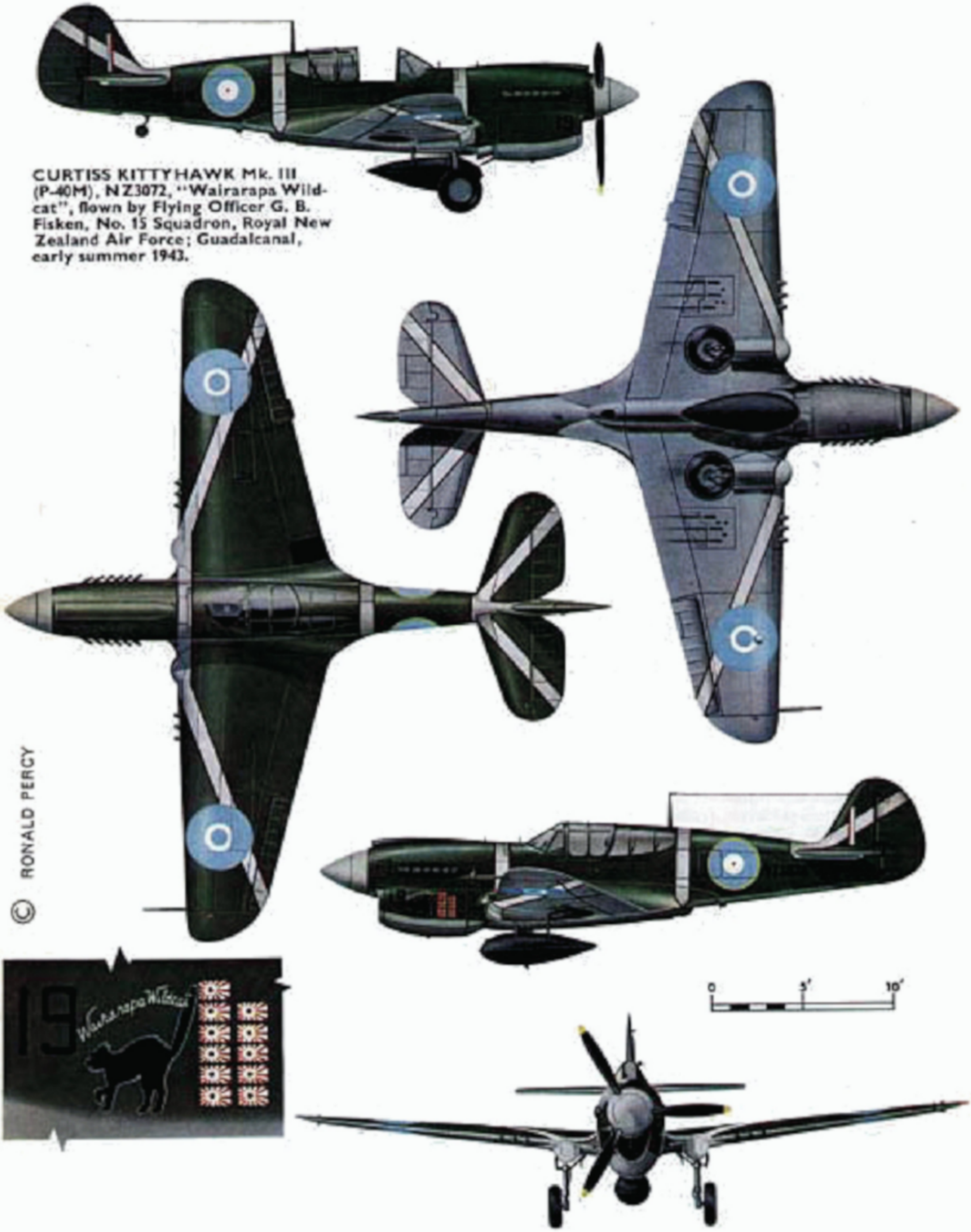
All the Commonwealth P-40N's were delivered in three main batches; although the R.A.F. evaluated them in the United Kingdom, they were employed solely abroad. The first batch of 130 machines were serialled *FS270* to *FS399*; the second, of 106 aircraft, from *FT849* to *FT954*; and the last, of 350 aircraft, from *FX498* to *FX847*. Most of these were phased out of service early in 1945, but one R.A.F. squadron continued to operate the Kittyhawk IV until the end of hostilities. Squadrons equipped with the P-40N included Nos. 112, 250 and 450.

THE KITTYHAWK IN THE DESERT

The experience of the R.A.F. and Commonwealth squadrons operating the Kittyhawk in the fighter and ground-attack rôles in the Middle East during

(continued on page 10)

Kittyhawk Mk. III's of Nos. 112 and 260 Sqns. on Cutella airfield, Italy, in 1944. The units carried out intensive ground attack operations throughout the Italian campaigns. (Photo: via R. Ward)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Wairarapa Wildcat
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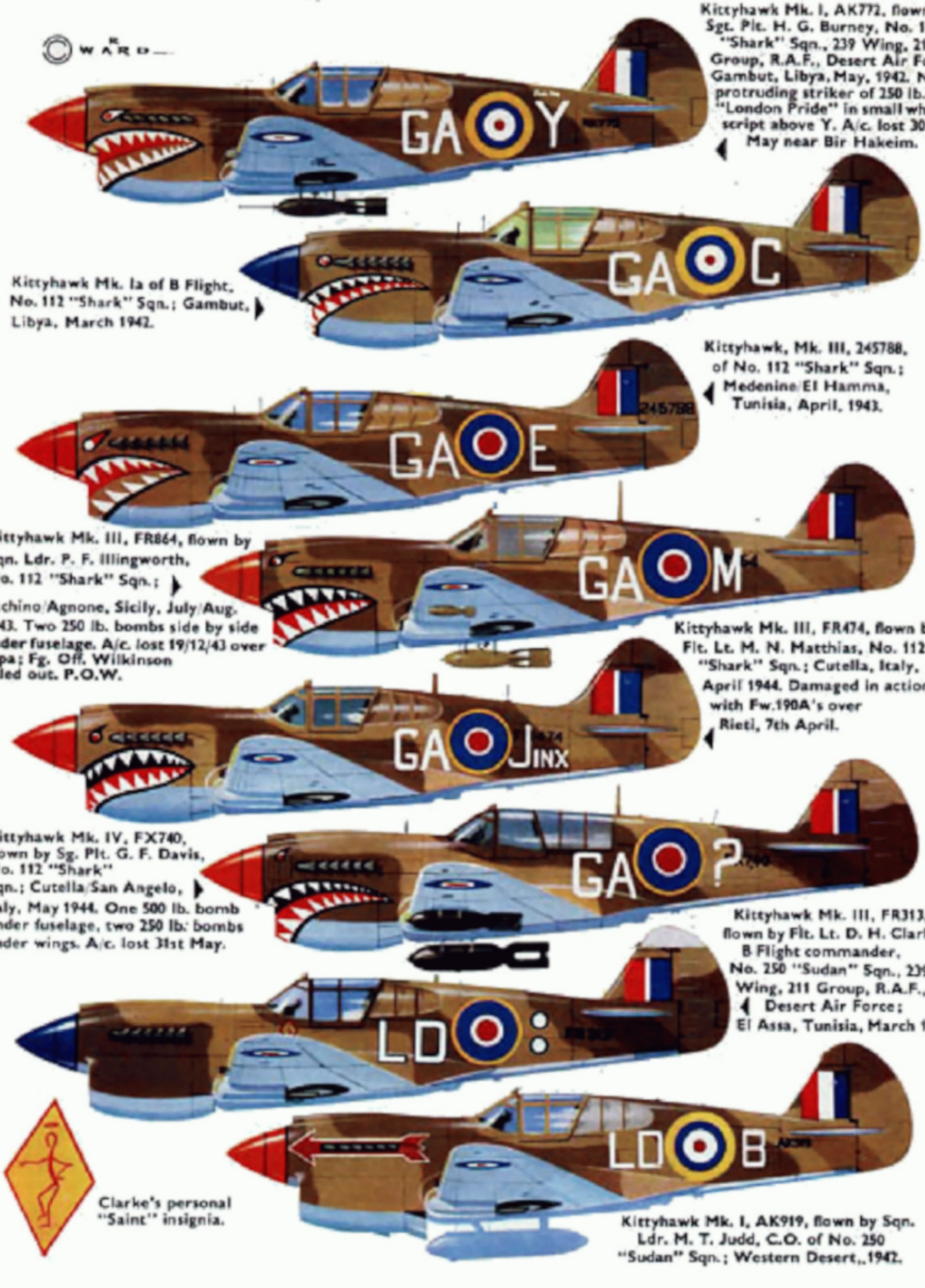
CURTISS KITTYHAWK Mk. III (P-40M), NZ3072, "Wairarapa Wildcat", flown by Flying Officer G. B. Fisken, No. 15 Squadron, Royal New Zealand Air Force; Guadalcanal, early summer 1943.

© RONALD PERCY



Kittyhawk Mk. I, AK772, flown by Sgt. Plt. H. G. Burney, No. 112 "Shark" Sqn., 239 Wing, 211 Group, R.A.F., Desert Air Force; Gambut, Libya, May, 1942. Note protruding striker of 250 lb. bomb. "London Pride" in small white script above Y. A/c. lost 30th May near Bir Hakeim.

Kittyhawk Mk. Ia of B Flight, No. 112 "Shark" Sqn.; Gambut, Libya, March 1942.

Kittyhawk, Mk. III, 245788, of No. 112 "Shark" Sqn.; Medenine/El Hamma, Tunisia, April, 1943.

Kittyhawk Mk. III, FR864, flown by Sqn. Ldr. P. F. Illingworth, No. 112 "Shark" Sqn.; Pachino/Agnone, Sicily, July/Aug. 1943. Two 250 lb. bombs side by side under fuselage. A/c. lost 19/12/43 over Ripa; Fg. Off. Wilkinson baled out. P.O.W.

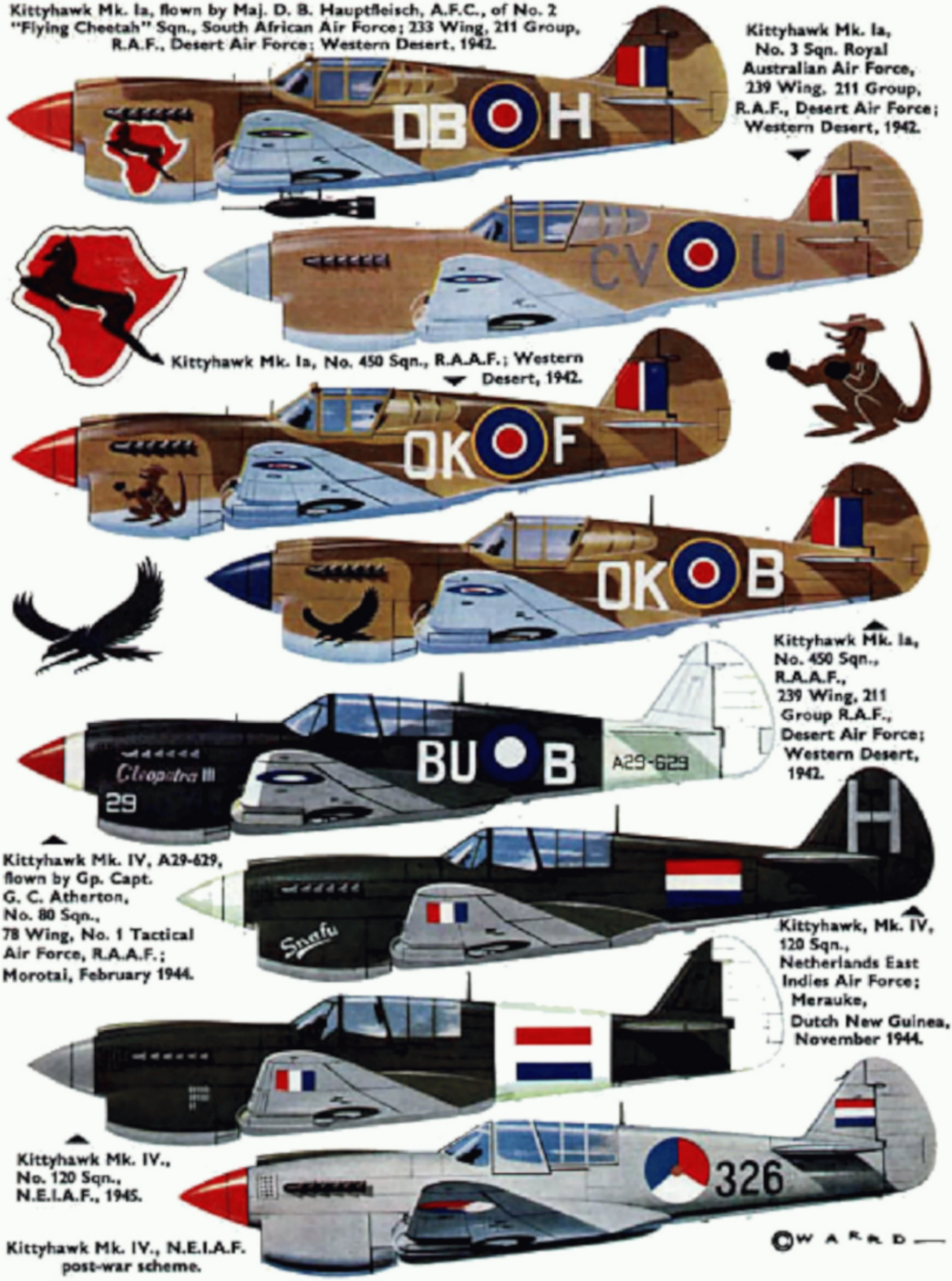
Kittyhawk Mk. III, FR474, flown by Flt. Lt. M. N. Matthias, No. 112 "Shark" Sqn.; Cutella, Italy, April 1944. Damaged in action with Fw.190A's over Rieti, 7th April.

Kittyhawk Mk. IV, FX740, flown by Sg. Plt. G. F. Davis, No. 112 "Shark" Sqn.; Cutella/San Angelo, Italy, May 1944. One 500 lb. bomb under fuselage, two 250 lb. bombs under wings. A/c. lost 31st May.

Kittyhawk Mk. III, FR313, flown by Flt. Lt. D. H. Clarke, B Flight commander, No. 250 "Sudan" Sqn., 239 Wing, 211 Group, R.A.F., Desert Air Force; El Assa, Tunisia, March 1943.

Clarke's personal "Saint" insignia.

Kittyhawk Mk. I, AK919, flown by Sqn. Ldr. M. T. Judd, C.O. of No. 250 "Sudan" Sqn.; Western Desert, 1942.



Kittyhawk Mk. Ia, flown by Maj. D. B. Hauptfleisch, A.F.C., of No. 2
"Flying Cheetah" Sqn., South African Air Force; 233 Wing, 211 Group,
R.A.F., Desert Air Force; Western Desert, 1942.

Kittyhawk Mk. Ia,
No. 3 Sqn. Royal
Australian Air Force,
239 Wing, 211 Group,
R.A.F., Desert Air Force;
Western Desert, 1942.

Kittyhawk Mk. Ia, No. 450 Sqn., R.A.A.F.; Western
Desert, 1942.

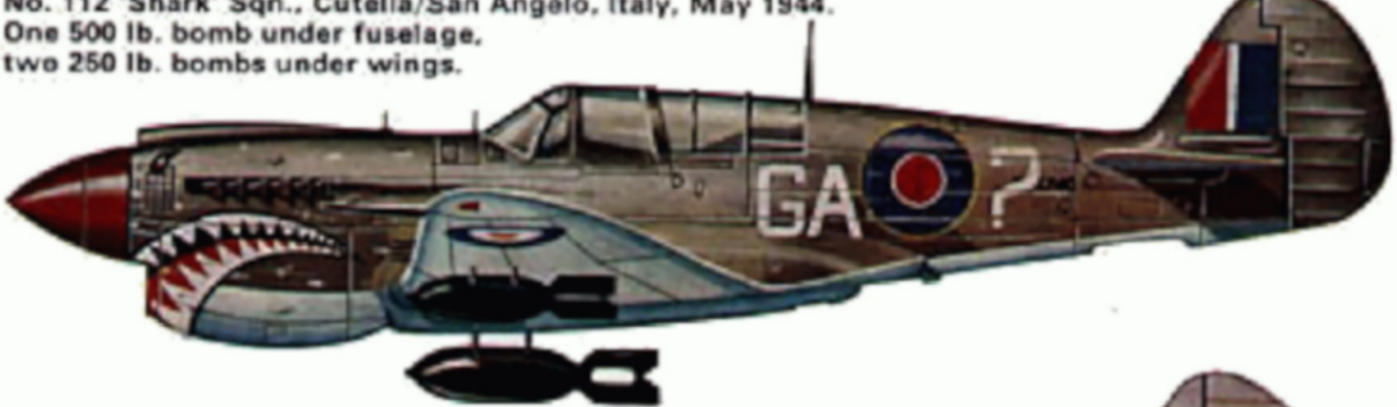
Kittyhawk Mk. Ia,
No. 450 Sqn.,
R.A.A.F.,
239 Wing, 211
Group R.A.F.,
Desert Air Force;
Western Desert,
1942.

Kittyhawk Mk. IV, A29-629,
flown by Gp. Capt.
G. C. Atherton,
No. 80 Sqn.,
78 Wing, No. 1 Tactical
Air Force, R.A.A.F.;
Morotai, February 1944.

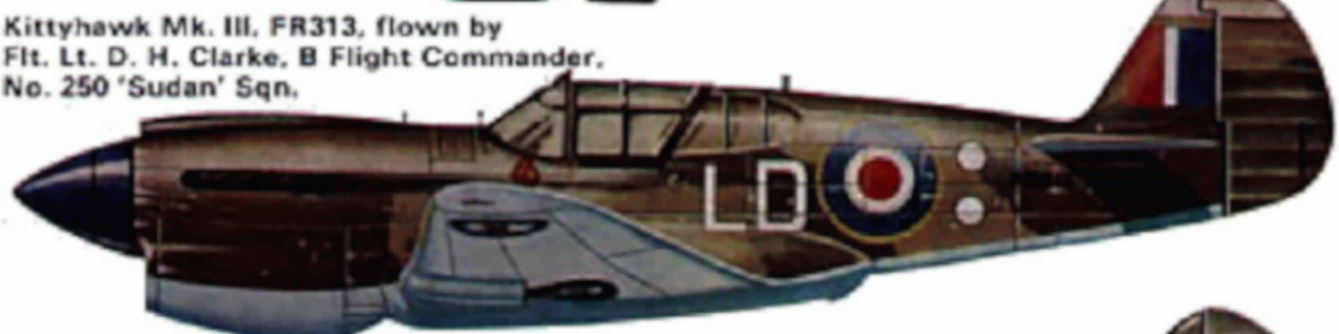
Kittyhawk, Mk. IV,
120 Sqn.,
Netherlands East
Indies Air Force;
Merauke,
Dutch New Guinea,
November 1944.

Kittyhawk Mk. IV.,
No. 120 Sqn.,
N.E.I.A.F., 1945.

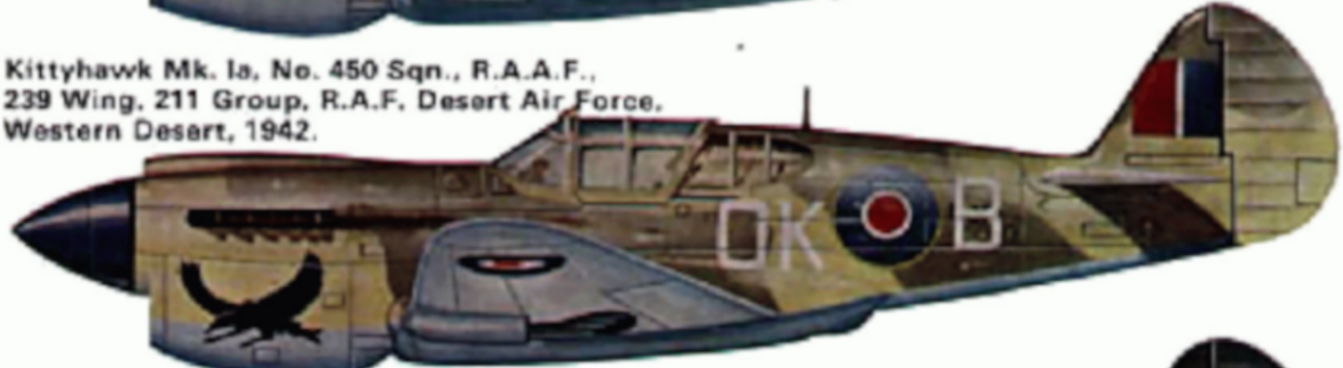
Kittyhawk Mk. IV., N.E.I.A.F.
post-war scheme.



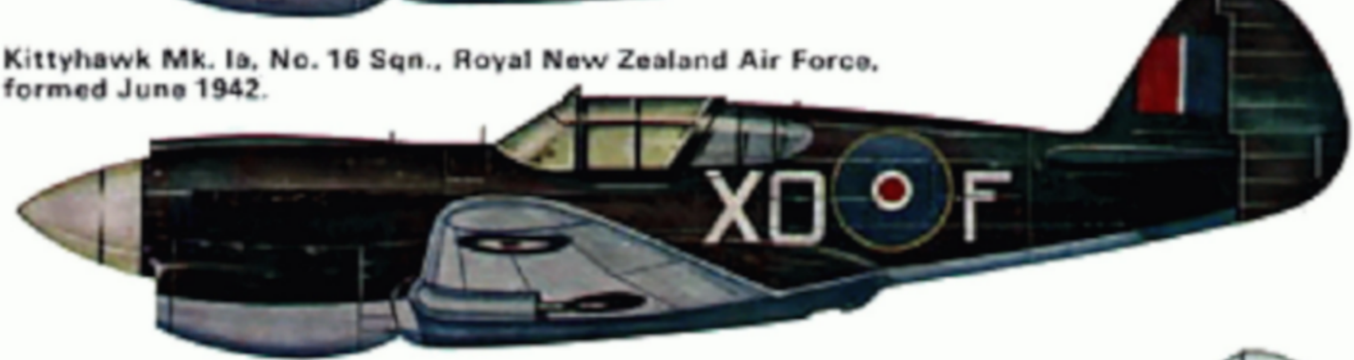
Kittyhawk Mk. IV, flown by Sgt. Plt. G. F. Davis, No. 112 'Shark' Sqn., Cutella/San Angelo, Italy, May 1944. One 500 lb. bomb under fuselage, two 250 lb. bombs under wings.



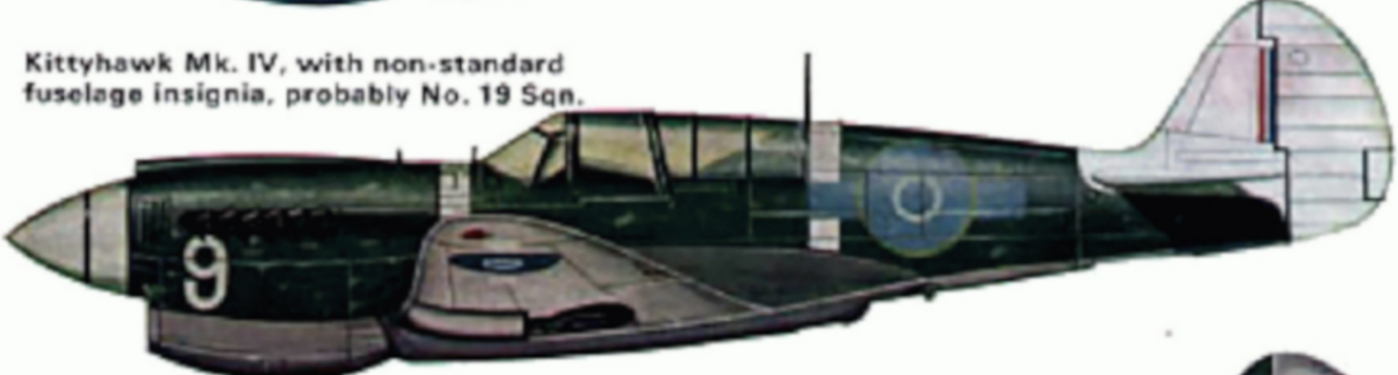
Kittyhawk Mk. III, FR313, flown by Flt. Lt. D. H. Clarke, B Flight Commander, No. 250 'Sudan' Sqn.



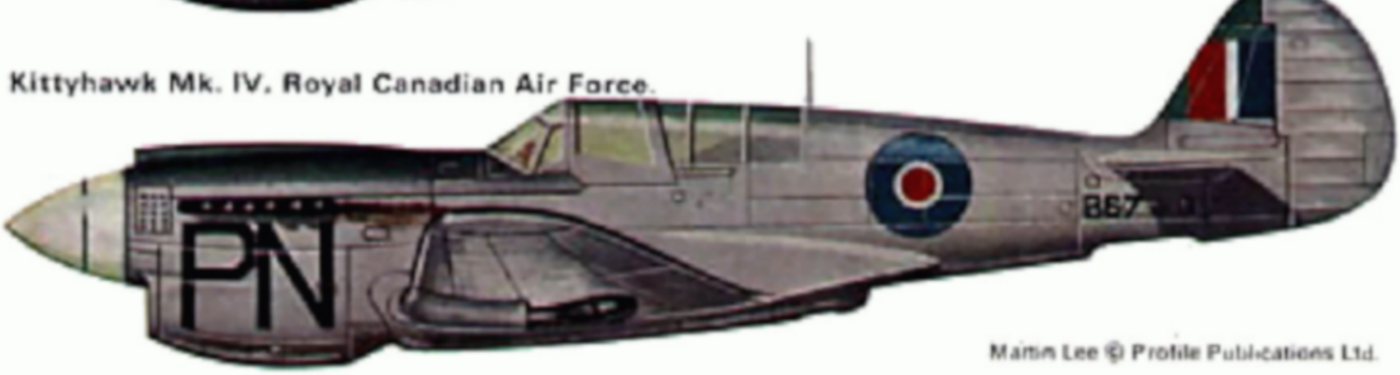
Kittyhawk Mk. Ia, No. 450 Sqn., R.A.A.F., 239 Wing, 211 Group, R.A.F. Desert Air Force, Western Desert, 1942.



Kittyhawk Mk. Ia, No. 16 Sqn., Royal New Zealand Air Force, formed June 1942.



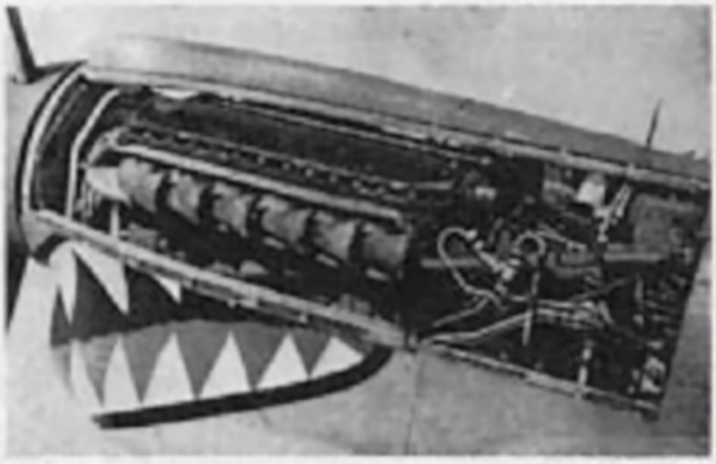
Kittyhawk Mk. IV, with non-standard fuselage insignia, probably No. 19 Sqn.



Kittyhawk Mk. IV, Royal Canadian Air Force.

Martin Lee © Profile Publications Ltd.

FX740, GA-?, a Mk. IV of No. 112 Sqn., takes off from Cutella/San Angelo in Italy with 1,000 lb. bomb load.
(Photo: via R. Ward)



Powerplant and bomb-mounting details of a "Shark" Squadron Mk. III. (Photos: via R. Ward)

1942 and 1943 may perhaps be illustrated best by the following extracts from the history of the famous and colourful No. 112 Squadron, R.A.F.; this unit is best remembered for the "sharksteeth" blazon which was applied to the cowlings of their Tomahawks, Kittyhawks, Mustangs, and, as late as 1957, Hawker Hunter jets. The origin of the marking is unknown; obviously it was an adaptation of that used by the A.V.G. in China, but the first use of the marking by No. 112 is obscure. It appeared some time in September 1941; it is thought possible that a Pilot Officer Westenra applied it as a personal marking, and was enthusiastically copied by all personnel. In any event, the unit operated the Tomahawk, Kittyhawk I, Kittyhawk III, and Kittyhawk IV throughout the desert campaigns and up into Italy, until re-equipped with the North American P-51B (Mustang III) in July 1944.

In January 1942 the squadron received its first Kittyhawk I's. The pilots are reported to have been immediately impressed and considered them a real improvement over the Tomahawk. On the 11th of the month a new C.O. arrived—the Australian Sqn. Ldr. Clive R. "Killer" Caldwell, who was to become probably the best-known Australian fighter pilot of the war.

The first victory by a squadron Kittyhawk was gained on 25th January; nine Kittyhawks led by Flt. Lt. Westenra flew close escort to nine Blenheims on a raid to Agedabia. On the return trip five Bf 109's attacked the formation west of Msus, and one was shot down by Sgt. Plt. Leu. Flying *AK637*, he made a head-on attack on the Messerschmitt and severely damaged its starboard wing. It was later seen to crash. No British machines were lost.

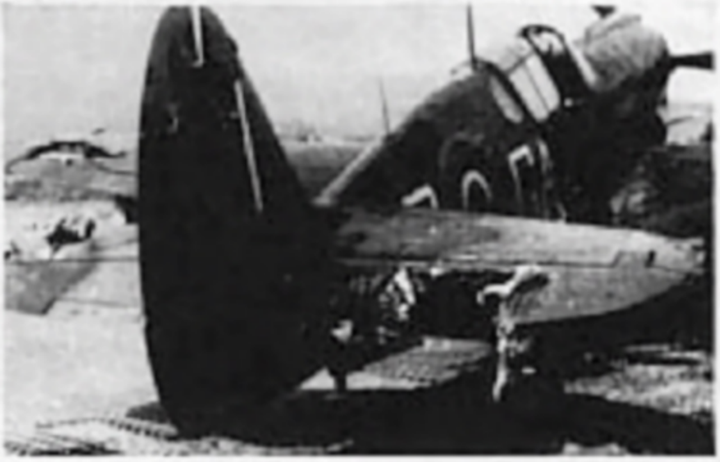
The squadron was engaged at that time in covering the Allied withdrawal in the face of Rommel's advance; living conditions were primitive, as No. 112 always operated well up in support of the Army and the accommodation usually consisted of a hole in the sand covered by a bivouac. Operations included many strafing attacks on Axis transport.

On 8th February the squadron once more flew escort for Blenheims, this time in a raid on Derna:

> "Nos. 3 and 75 Squadrons were also there to act as top cover, but four of these were obliged to return to base with engine trouble for a start. What were left were intercepted by a surprise attack by three Messerschmitt Bf 109's, and one Kittyhawk was shot down and another so badly damaged that it barely returned to Gambut. The enemy flew off before they could be engaged and in the confusion five more Kittyhawks lost contact with the Blenheims and (with) 112 and returned to base. Thus 112 were left by themselves, with only one aircraft from the other two squadrons, to cover the return of the Blenheims. There was a rearguard fight and three pilots—Sgt. Plts. Elwell, Donkin and Hoare—failed to return. One Bf 109F flew a parallel course to the bombers out to starboard to act as decoy, and Flt. Lt. Humphreys managed to get in an attack on him. The Bf 109's then started a series of "dive and away" tactics. Sgt. Plt. Burney finished off the decoy near Bomba, and also saw a Messerschmitt and a Kittyhawk crash into the sea about twenty yards apart, east of the Gulf of Bomba. Sgt. Plt. Elwell and Sgt. Plt. Hoare were almost certainly shot down, and one of them took a Bf 109 with him. The score was one Bf 109F destroyed by Sgt. Plt. Burney, one Bf 109F destroyed by an unknown pilot and one more shared between Flt. Lt. Humphreys and Sgt. Plt. Burney. Total—three all."

On 14th February the squadron won a spectacular victory:

By 1944, ground attack sorties in Italy were extremely hazardous; anti-aircraft machine guns and 20 mm. cannon were used in great numbers by the German forces and the flak was as accurate as it was intense. Note the damage to the wing and tailplane of this 112 Sqn. Kittyhawk; the type was renowned for its ability to absorb combat damage, but losses were still heavy.
(Photo: via R. Ward)



"Ten Kittyhawks, led by Plt. Off. Bartle in *AK700*, with Sgt. Plt. Simonsen (*AK682*), Plt. Off. Duke (*AK578*), Sgt. Plt. Leu (*AK781*), Plt. Off. Dickenson (*AK804*), Sgt. Plt. Evans (*AK637*), Sgt. Plt. Drew (*AK653*), Sgt. Plt. Christie (*AK761*), Sgt. Plt. Cordwell (*AK630*), Sgt. Plt. Burney (*AK702*) and eight aircraft of No. 3 Squadron R.A.A.F., were scrambled to meet an approaching enemy formation. After flying north to Tobruk the Kittyhawks turned west over the perimeter defences and climbed steadily until, over Acroma, No. 3 Sqn. were flying at 8,000 ft. with 112 slightly ahead and above, just below the cloud base, and at an ideal height for the Kittyhawk. At this moment, they spotted about a dozen M.200's and M.202's in a loose vic formation, 2,000 ft. below them, to the left and in front. Plt. Off. Bartle warned the Australians, who had, however, already seen a formation of enemy bombers, with a close cover escort, flying at less than 2,000 ft. 112 concentrated on the fighters, who by now were climbing to meet the attack. Their courage failed them and they hurriedly tried to form a defensive circle, in a half-hearted fashion. The Kittyhawks dived into them and in the initial attack every aircraft of 112 Squadron must have hit something. Sgt. Burney, having dived through the formation, saw the bombers below; they were BR.65's, and so he carried on down and shot one down. This aircraft attempted to evade, but it hit the ground. . . By the time he regained the formation there were no enemy fighters to be seen amongst the milling Kittyhawks. Sgt. Plt. Cordwell, in his first action, shot away about three-quarters of the wing of a Bf 109F, which spun in out of control. Sgt. Plt. Evans attacked an M.200 as it was turning and shot about two feet off its starboard wing. It dived steeply and was probably destroyed. Sgt. Plt. Drew, also on his first real engagement, got himself two M.200's, one of which he saw hit the ground: 'It was as easy as breakfast in bed', he is recorded as saying. Plt. Off. Duke attacked an M.200 which was seen to spin in and crash by Sgt. Plt. Evans. He also attacked another Macchi at ground level from dead astern and it flew into the ground and burst into flames. This kill was shared by Sgt. Plt. Reid of No. 3 Sqn. R.A.A.F. (who was in CV-W). The enemy's defence was to adopt a circle, and when evading, to dive down to ground level in rolls and vertical dives. Sgt. Plt. Leu attacked an M.200 which blew up, and another one which went into the ground. Sgt. Plt. Simonsen certainly destroyed one M.200 which he saw spin into the ground, and probably he damaged another. Plt. Off. Dickenson made a stern attack on another M.200 which was enveloped in a sheet of flame at 1,000 ft. Sgt. Plt. Christie claimed two M.200's destroyed and another damaged. His account was that he dived and gave one Macchi a heavy burst so that the aircraft climbed steeply, and then spiralled and crashed, bursting into flames. He dived on the second, which stalled, pouring out black smoke and going into a dive. He had a go at a third and probably damaged it, but without any visible result. Sgt. Plt. Evans also attacked an M.200 which dived away so steeply that it was doubtful whether it could have pulled out. Plt. Off. Bartle gave another M.200 a good burst which sent it down out of control and damaged a Messerschmitt 109F which he chased all the way to Tmimi. No. 3 Sqn. in the meanwhile were about to fall on the bombers when they saw six Messerschmitt 109's lurking about. They wheeled round in time and in the ensuing dogfight four of them were destroyed and another one damaged. They then concentrated on the bombers. By the end of the fight the remnants of the enemy formation had fled. Of the estimated total strength, at the beginning, of thirty-two enemy aircraft, twenty were claimed destroyed, two probably destroyed and ten damaged. Neither of the Kittyhawk squadrons lost an aircraft in what was the text-book example of a perfect interception; both top and extra cover being eliminated before the bombers were attacked. No. 3 R.A.A.F.

No. 120 Sqn. of the Netherlands East Indies Air Force operated the Kittyhawk against the Japanese from Merauke, Dutch New Guinea. Note the national insignia painted on a white field.
(Photo: R.Neth.A.F.)

A Mk. IV of No. 120 Sqn. N.E.I.A.F. at Merauke in 1945.
(Photo: via G. H. Kamphuis)

Royal Canadian Air Force Kittyhawks over Alaska. (Photo: Imp. War Mus. CAN1641)

A photograph of poor quality but great historic interest; an early-model Kittyhawk of either No. 75 or 76 Sqn. Royal Australian Air Force at Milne Bay, New Guinea, in July 1942; note the original brown/green/sky camouflage. This action saw the first retreat of Japanese troops in the "island war". (Photo: Imp. War Mus. AUS1549)

Sqn. were particularly pleased with their success as a lot of their pilots were newcomers. 112 Squadron's share of this total was eleven and a half destroyed, two probables and three damaged. In that fight the squadron fired seven thousand and sixty rounds."

Another extract pinpoints the start of the Kittyhawk's career as a fighter-bomber, the rôle which it was to take on with increasing frequency as the desert war moved to its close.

> "On 10th March there was a significant development. Sq. Ldr. Caldwell made the first practice bombing dive, carrying an unfused 250 lb. bomb, to see whether it could be dropped without carrying away the propeller. Since this might mean a crash it was done over the sea with the Air Sea Rescue Organisation laid on. This experiment was a success and it was repeated during the afternoon with a live bomb. While the Kittyhawk was far from being outclassed in air-to-air combat, its potential as a ground attack aircraft was now being realised. It could carry quite a weight of bombs, and its ability to absorb punishment was legendary."

And again:

> "In May there was a conference between the Senior Air Staff Officer and the squadron commanders of 239 Wing, and it was impressed on them that the fighter bomber could only be developed and used effectively if the pilots were trained in bombing. This was the signal for the conversion of 112 Squadron, who, on 16th May, became the first Fighter-Bomber squadron in the Desert Air Force."

The fierce fighting around the Free French bastion of Bir Hakeim, in late May and early June 1942, gave the newly-launched Kittybombers a thorough baptism of fire:

> "At 10.45 hours (on 27th May) five aircraft led by Flt. Lt. Dickenson went out to bomb a pin-point, two trucks being destroyed and twelve damaged. During the day the squadron carried out thirty bombing sorties, dropping twenty-two 250 lb. bombs; the claim at the end of the day was forty-seven M.T. vehicles hit and nine totally destroyed. Flt. Lt. Dickenson was reported missing. The fighter-bombers were able to deal havoc amongst the soft-skinned vehicles that were concentrating round Bir Hakeim, at low altitudes which would have been suicide for light bombers. The three squadrons, Nos. 3, 112, and 274, between them averaged 350 sorties per day between 27th and 31st.
>
> "On 28th Flt. Lt. Dickenson returned to the squadron, and there was another day of continuous bombing, in relays. By the end of it Flt. Lt. Dickenson was missing again, and he never came back. Twenty-three 250 lb. bombs were dropped in thirty-nine sorties, claiming eighteen trucks destroyed and twenty-two damaged".

To have produced sortie figures of this order, every squadron pilot must have flown either three or four low-level strike missions per day.

ACROSS THE MEDITERRANEAN

The squadron continued its bombing and strafing activities back to El Alamein; after the 8th Army's victory the squadron moved west again, following hard on the heels of the Axis retreat and harrying the *Afrika Korps* without respite. They took part in the fighting in Tunisia, by that time equipped with Kittyhawk III's; and were heavily engaged in the invasion of Sicily. When the fighting moved across the Straits of Messina onto the Italian mainland, 112 was there. They were by now almost wholly engaged in ground-attack actions, encountering enemy aircraft with less and less frequency; their usual targets were transport vehicles, tanks, troop concentrations, bridges, trains, and coastal shipping. They flew missions over the Adriatic to attack German troops in Jugoslavia; and played their part in relieving the pressure on the Anzio and Salerno beachheads. An extract from the account of the squadron's activities in January 1944 gives an idea of the technique followed at this time:

> "The strike by the squadron usually followed a recce of the target by a Tac-R Spitfire, and for strikes the aircraft were usually armed with two 250 lb. bombs, fused either for instantaneous or surface bursts. The earlier version of surface bomb used to have a long metal striker protruding out of the nose, which exploded the bomb above ground, thus not cratering. Later versions used in Sicily and Italy had pressure fuses, activated by the buildup of air pressure between the bomb and the ground. Anti-personnel bombs were carried beneath the wings. M.T. were bombed in the following fashion—the leader, having spotted his target from a

A29-357, SV-A, a Kittyhawk Mk. IV of No. 76 Sqn. R.A.A.F. landing at Vivigani Strip on Goodenough Island in the Solomon Sea in 1943. (Photo: via R. Ward)

A Kittyhawk, probably of No. 15 Sqn., Royal New Zealand Air Force, takes off from Torokina airfield on Bougainville in the Solomons. In the background, U.S.A.A.F. P-39 Airacobras.
(Photo: Imp. War Mus. (OWI)KY 11351 E).

Fine study of Kittyhawk Mk. IV's of No. 80 Sqn., R.A.A.F. with two 500 lb. bombs carried underwing. The nearest aircraft, "Cleopatra III", is a P-40N-20-CU, U.S: serial 43-22834, R.A.A.F. serial A29-629, flown by Group Captain G. C. Atherton. Note white-painted wing leading edges.
(Photo: via Barry Pattison)

cruising altitude then manoeuvred his formation to cross the road at right angles, with his target inboard of his wing tip, and his section in echelon away from the target in loose formation. On a 'line' target (road, railway, or bridge) the main errors were 'short' or 'over' rather than lateral ones. The aircraft dived at a 60 degree angle from about 6,000 ft.—8,000 ft. down to 2,000 ft. or 1,500 ft. With the target under his wing, and having told his section to arm their bombs, the leader would radio 'Going down left (or right) now !' and would then wing-over into a diving turn. Using his reflector sight he would steady his aircraft on the target and start to pull out about 2,500 ft., counting to ten and then releasing his bomb. The section bombed individually from line astern. Red Section would then re-form and climb away and Blue Section would then attack . . .

"The Kittyhawk was designed as a fighter aircraft and there was an element of luck, as well as skill, when it was being used as a bomber. Much depended on the leader, and where he put his section prior to the dive. If the dive was too steep the Kittyhawk would build up too much speed and would start to twist or roll, which involved corrections and the aircraft would be skidded, which would throw the bomb off sideways. 'Over' and 'Under' errors were mainly due to too shallow a dive".

On 9th April 1944, the squadron received new aircraft; not the promised Mustangs, but Kittyhawk IV's, which caused some disappointment. These were often operated with a 2,000 lb. bomb load; a 1,000 lb. weapon under the belly and two 500 lb.-ers under the wings. Between April and July, when the Mustangs finally arrived, the squadron continued its ground-attack activities. *Luftwaffe* aircraft were hardly ever met in the air, although there had been a sharp brush on 7th April when twelve Kittyhawks surprised an equal number of Focke-Wulf Fw 190A's taking off from Rieti; they destroyed three and damaged three more for the loss of two Kittyhawks and two pilots. The whole combat took place amidst heavy automatic fire from the ground, and characterised the grim business which ground-attack flying had become by this point in the war. The flak was always heavy and

Line-up of R.A.A.F. Kittyhawk IV's of No. 78 Sqn. at Noemfoor, Dutch New Guinea, bombed up for a mission against Vogelkop. The aircraft in the foreground, "Hot Stuff!", is a P-40N-15-CU, U.S. serial 42-106380, R.A.A.F. serial A29-574, HU-Q.
(Photo: via Barry Pattison)

Kittyhawk Ia's of Nos. 14 (top), *15* (above) *and 16 Sqns.* (right) *R.N.Z.A.F. display a variety of early marking and camouflage schemes.* (Photos: d'E. C. Darby & R.N.Z.A.F.)

accurate, and aircrew were lost in increasing numbers; there was of course no chance of baling out once one was committed to a diving attack.

On 29th May 1944 "... tanks in a wood were the primary target of the first mission ... followed by the usual road strafe. The second operation bombed a crossroads at Frosinone and then went on to strafe. Sgt. Plt. Parkinson was hit by flak when only 20 ft. above the ground, and the aircraft (GA-S) crash-landed heavily breaking its back. Half a minute later the aircraft was enveloped in smoke and flames and it was considered that the pilot must have been killed. It was Sgt. Parkinson's second operation, and he had been on the squadron only six days. The leader's aircraft was also damaged when a vehicle disintegrated, and he had to be escorted back to base ... On the third operation the leader, Flt. Lt. Matthias in *FX777* (GA-C) was hit in the glycol tank and crash-landed near Nettuno where he was picked up by an American unit ...

"The 30th was another bad day, as Sgt. Plt. Rees failed to return from the second operation. Both missions were attacks on M.T. and roads, and Sgt. Plt. Rees ran into some of the intense and accurate M.G. fire and 20 mm. flak. He was heard to say, 'I've been hit, cannot see anything, going down'. He was not heard again, and no wreckage could be found ... The month ended with a third pilot missing, Sgt. Plt. Davis, on his third operational sortie ..."

THE PACIFIC

The Kittyhawk was used in large numbers by the Royal Australian Air Force throughout the South-West Pacific campaigns; by the end of 1943 it is estimated that 485 machines had been received by that service. Operated by Nos. 75, 76, 77, 78, 80, 82, 84 and 86 Squadrons R.A.A.F., the Kittyhawk was used as a low-altitude fighter and a ground attack aircraft on many fronts, the most notable actions in which they participated being the fighting in New Guinea, New Britain, Indonesia and Borneo. It was considered risky for the P-40's to allow themselves

Kittyhawk Mk. IV's of an unidentified New Zealand fighter squadron en route for the islands display another variation of R.N.Z.A.F. identification markings. (Photo: R.N.Z.A.F.)

Flying study of Netherlands Kittyhawks over Dutch New Guinea. (Photo: via R. Ward)

to be drawn into dog-fighting with the much less sturdy but more manoeuvrable A6M *Zeros* and Ki-43 *Hayates*, a quick diving attack and a fast break at low level being the approved tactics. Although progressively replaced by Mustangs and Spitfires, the Kittyhawks continued to serve with three of the four squadrons of No. 78 Wing (Nos. 75, 78, and 80 Sqns.) until the end of hostilities. In smaller numbers the type saw service with the Royal New Zealand Air Force; the famous machine flown by Fg. Off. G. B. Fisken in the Solomons campaign is the subject of the five-aspect painting on p.2 of this *Profile*. It is believed that Fisken was the highest-scoring R.N.Z.A.F. pilot in the Pacific theatre.

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Representative aircraft

The following are some of the machines operated by No. 112 Sqn. during its service in the Middle East:

Kittyhawk I; January 1942, Mechili/Gazala: *AK561*, *AK578*, *AK583*, *AK595*, *AK637*, *AK685*, *AK702*, *AK700* (usually flown by Plt. Off. Bartle) and *AK730* (usually flown by Flt. Lt. Westenra).

Kittyhawk Ia; June 1942, Amriya: *ET510*, *ET511*, *ET526*, *ET527*, *ET910*.

Kittyhawk III; March 1943, Medenine/El Hamma: *FL714*, *FL886*, *FR115*, *FR336*, *FR424*, *245790*.

Kittyhawk III; August 1943, Agnone, Sicily: *FR516* "A", *FR860* "D", *FR839* "J", *FR494* "W", *FR796* "N", *FR355* "R".

Kittyhawk IV; April 1944, Cutella, Italy: *FX541* "A", *FT857* "E", *FX563* "F", *FX558* "Q", *FX622* "W", *FT921* "Z".

SPECIFICATION

	P-40D	P-40E	P-40K	P-40M	P-40N*
	Kittyhawk I	Kittyhawk Ia	Kittyhawk III	Kittyhawk III	Kittyhawk IV
Wing span	37 ft. 4 in.	37 ft. 4 in.	37 ft. 4 in.	37 ft. 4 in.	37 ft. 4 in.
Wing area (sq. ft.)	236	236	236	236	236
Length	31 ft. 2 in.	31 ft. 2 in.	31 ft. 2 in.	31 ft. 2 in.	33 ft. 4 in.
Height	10 ft. 7 in.	10 ft. 7 in.	10 ft. 7 in.	10 ft. 7 in.	12 ft. 2 in.
Weights (lbs.)					
Empty	6,208	6,350	6,400	6,480	6,000
Normal loaded	7,740	8,100/9,100	8,400	8,000	7,400
Max. loaded	8,809	9,200	10,000	8,900	8,850
Max. speed (at 15,000 ft.)	350 m.p.h.	354 m.p.h.	362 m.p.h.	360 m.p.h.	343 m.p.h.
Cruise (m.p.h.)	258	300	290	272	282
Landing (m.p.h.)	85	81	82	82	82
Range (miles)	800	700	700	700	750
Max. range (ferry)	1,150	1,500	1,600	1,600	1,400
Service ceiling (feet)	30,600	29,000	28,000	30,000	30,000
Climb (f.p.m.)	2,580	2,050	2,000	2,050	2,120
Armament (·50 cal. m.g.'s)	4 or 6	6	6	6	6
Fuel (gallons)**	148	157	157	157	122

* =*Initial models: see text for later developments.*
** =*Internal capacity.*

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